

**REMARKS**

In the Office Action, claims 1-8, 22-35, and 43 were rejected. By this response, claims 1, 2, 22, 27, 29, and 43 have been amended, and new claims 44-55 have been added. Claims 1-8, 22-35, and 43-55 are currently pending in the present application. Reconsideration of the rejections and allowance of the pending claims are respectfully requested.

**Rejection Under 35 U.S.C. § 102**

Claims 1, 2, 4-7, 22-25, 27, 29-34 and 43 were rejected under 35 U.S.C. § 102(b) as being anticipated by Watanabe (JP 2000-192135). Independent claims 1, 22, 27, and 29 have been amended by this response. In the Office Action, the Examiner stated:

As shown in Figure 1, Watanabe discloses an induction heating system having a power source, a fluid cooling unit, an induction heating device (100C, 101C, 102C), a system controller, a flow switch (500) wherein the controller controls operation of the power source and the cooling unit to prevent heat damage to stop power to the induction heating device when the cooling flow through the flow switch is below the set desired flow rate (see the English translation sections [0010] – [0018]). The term “portable” is highly relative as any unit may be considered as “portable.”

However, with regard to amended independent claim 1, the Watanabe reference fails to disclose a “flexible fluid-cooled induction heating device.” Unlike the presently claimed “*flexible*” induction heating device, the induction coils (100C, 101C, and 102C) of the cited reference are illustrated as fixed and having no flexibility. In addition, the cited reference discloses the use of “pipe,” not a *flexible* fluid-cooled induction heating device, for conveying cooling fluid to the coils (100C, 101C, and 102C). In addition, the “pipe” of the Watanabe reference is illustrated as a separate component from the induction coils (100C, 101C, and 102C) and unlike the fluid-cooled induction heating cable of the present embodiments, is not integrated in an assembly with the coils to form a “flexible fluid-cooled induction heating device,” as recited by claim 1. This is not surprising, as the cited reference is directed to heat treatment of

crankshafts, an application that typically takes place in a fixed, conventional location, such as a machine shop or manufacturing plant.

The differences between the presently claimed subject matter and the cited reference are highlighted, for example, by the more versatile applications of the present embodiments of on-site induction heating system. For example, amended independent claim 22 recites a method of operating a portable fluid-cooled induction heating system...comprising: "routing a flexible fluid-cooled induction heating apparatus around a work piece." In addition, the Watanabe reference also fails to disclose a method of assembling a portable induction heating system at a worksite, comprising: "wrapping a flexible fluid-cooled induction heating cable around a work piece, as claimed in amended independent claim 29. These methods are in stark contrast to the rigid capability of the fixed induction coils and pipe disclosed in Watanabe. Accordingly, Applicants respectfully submit that the subject matter of amended independent claims 1, 22, and 27, as well as the claims dependent thereon, are not anticipated by Watanabe reference.

Similarly, as the system of Watanabe is intended for use in a fixed location, Watanabe does not disclose a portable induction heating system, comprising a power source, a fluid cooling unit, and "a wheeled cart adapted to transport the fluid cooling unit and the power source to a work piece, as recited in amended independent claim 29. Therefore, Applicants also respectfully submit that the subject matter of amended independent claim 29, as well as the claims that depend therefrom, are not anticipated by Watanabe reference.

For all of these reasons, claims 1, 2, 4-7, 22-25, 27, 29-34 and 43 are not anticipated by the Watanabe reference. Withdrawal of the rejection and allowance of the claims are respectfully requested.

**First Rejection Under 35 U.S.C. § 103**

Claims 3, 8, 26, 28 and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Watanabe (JP 2000-192135). Specifically, the Examiner stated:

Watanabe discloses the claimed invention except for the explicit showing of controlling the operation of the cooling unit to increase flow when the flow rate is low. However, the same would have been obvious to an ordinary artisan in view of Watanabe as it reaches the use of a solenoid valve and manual bulb to adjust the flow amount of coolant (see section [0009] in order to maintain the desired coolant flow rate to prevent overheating of the induction coils. In regard to claims 8 and 35, the use of any well known communication device as an alarm device to notify the user would have been a matter of engineering design variations of alarm lamps or buzzers of Watanabe (see section [0015]).

Applicants respectfully traverse this rejection. The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985).

Additionally, if the Examiner relies on a theory of inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. *See In re Robertson*, 169 F.3d 743, 49 U.S.P.Q.2d 1949 (Fed. Cir. 1999). The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. *See id.* In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or sound and supportable technical reasoning to support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art. *See Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464

(B.P.A.I. 1990). The Examiner, in presenting the inherency argument, bears the evidentiary burden and must adequately satisfy this burden. *See id.*

Initially, as discussed above, Applicants note that all of the independent claims are believed to be allowable over the Watanabe reference. Therefore, all of the cited dependent claims are believed to be allowable by virtue of their dependency on their respective allowable base claims 1, 22, 27, and 29. Accordingly, Applicants respectfully request withdrawal of the Examiner's rejection and allowance of claims 3, 8, 26, 28 and 35.

Furthermore, the dependent claims 3, 8, 26, 28 and 35 rejected under 35 U.S.C. § 103 (a) are also patentable for the subject matter they separately recite as well. With regard to claim 3, the Examiner acknowledges that the Watanabe reference failed to disclose "controlling the operation of the cooling unit to increase flow when the flow rate is low," but asserts that "the same would have been obvious to an ordinary artisan in view of Watanabe as it teaches the use of a solenoid valve and a manual bulb to adjust the flow amount of coolant in order to maintain the desired flow rate to prevent overheating of the induction coils." Applicant respectfully disagrees. The Examiner has not satisfied the Examiner's evidentiary burden in asserting that the recitation of claim 3 is obvious to an ordinary artisan in view of Watanabe. The Watanabe reference clearly describes only an entire system shutdown (and conventional alarm indications) upon a low flow condition, and never teaches, implies, or suggests to increase the flow of cooling water in response to a low flow condition. *See* paragraphs 15 and 16. In fact, the cooling fluid supply piping is not even illustrated. Moreover, the reference teaches away from increasing flow upon an alarm condition, with a preference for total system shutdown because the reference is concerned with pipe leaks, for example. *See* paragraph 16.

With regards to claims 8, and 35 (and apparently claim 26), the Examiner asserts that "the use of any well known communication device as an alarm device to notify the user would have been a matter of engineering design variations of alarm lamps or buzzers of Watanabe." Applicants respectfully disagree. The use of a communication device, such as a pager, to notify,

for example, a technician, is completely different and clearly does not necessarily flow from the local alarm indications described in the Watanabe reference. Again, the Examiner has not met the Examiner's burden in a "well-known" (or inherent) obviousness assertion. Furthermore, it is clear that the cited reference does not teach, suggest, or disclose the subject matter of dependent claims 8, 26, and 35.

Finally, the Examiner did not specifically address claim 28, which recites, "wherein the flow sensor is disposed within an enclosure housing the power source controller." However, the cited reference never describes how the Watanabe flow switch is to be housed or enclosed, but simply discloses that the switch is installed on the cooling fluid discharge piping (eccrisis side). *See* paragraph 10. It is clear that the reference relied on by the Examiner never discloses, suggests, nor teaches the recited features of claim 28.

In sum, the Watanabe reference fails to disclose, teach, or suggest all of the recited features of the rejected dependent claims. Similarly, the Examiner has failed to demonstrate that any of these features are inherent, well-known, or obvious in view of Watanabe. Accordingly, the Examiner has failed to establish a *prima facie* case of obviousness.

#### **Second Rejection Under 35 U.S.C. § 103**

Claims 1-8, 22-35, and 43 were further rejected under 35 U.S.C. § 103(a) as being unpatentable over Dion et al. (U.S. Patent No. 5,101,086) (cited by Applicant), in view of Watanabe (JP 2000-192135). Specifically, the Examiner stated:

Dion discloses a portable induction heating system having a power source (17), a portable fluid cooling unit 23, an induction heating device (12, 15 and 18) an inherently a system controller. It fails to show the use of a flow [sic] wherein the controller controls operation of the power source and the cooling unit t prevent heat damage to stop power to the induction heating device when the cooling flow through the flow switch below the set desired flow rate (see Figures 1, 1A and 2 and col. 2, line 58 – col. 3, line 42). Watanabe discloses in Figure 1 an induction heating system having

a power source, a fluid cooling unit, an induction heating device (100C, 101C, 102C), a system controller, a flow switch (500) wherein the controller controls operation of the power source and the cooling unit to prevent heat damage to stop power to the induction heating device when the cooling flow through the flow switch is below the set desired flow rate (see English translation sections [0010] – [0018]). It should have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dion to provide a flow switch to monitor the flow rate of the cooling fluid to maintain sufficient cooling fluid to the induction heating device and to control the power supply to prevent overheating of the heating system, in view of the teaching of Watanabe.

However, the cited claims are patentable because the Dion reference does not provide the subject matter recited in the claims that is not disclosed or suggested by Watanabe. In this rejection, the Examiner cited Dion as the primary reference, asserting that the Dion reference discloses the recited features of rejected claims 1-8, 22-35, and 43, including disclosing inherently a system controller, except the Examiner relies on the Watanabe reference as disclosing “the use of a flow [sic] wherein the controller controls operation of the power source and the cooling unit to prevent heat damage to stop power to the induction heating device when the cooling flow through the flow switch below the set desired flow rate.” However, the Dion is deficient as the primary reference with regard to the independent claims (claims 1, 22, 27, and 29) for the same reasons as the Watanabe reference. For example, the Dion reference fails to disclose a “flexible fluid-cooled induction heating device,” as recited by amended claim 1. Instead, Dion discloses a Litz wire used in combination with a magnetic flux concentrator having circulating cooling fluid. *See* Dion, column 1, lines 8-18. Also, for example, Dion fails to disclose or suggest the methods recited in claims 22 and 27. For example, Dion does not suggest “routing a flexible fluid-cooled induction heating apparatus around a work piece,” as recited in amended claim 22 or “wrapping a flexible fluid-cooled induction heating cable around a work piece,” as recited in amended claim 29. This is not surprising, as the disclosed heating system in Dion is directed to a heating a calendar roll of a papermaking process. *See* Dion, column 3, lines 45-54. The cited reference notes that the heating devices are “stationary.” *Id.* Thus, Dion

clearly does not suggest: "a wheeled cart adapted to transport the fluid cooling unit and the power source to a work piece," as recited in amended independent claim 29. Accordingly, none of the rejected claims are obvious in light of the cited references. For all of these reasons, claims 1-8, 22-35, and 43 are patentable over the Dion and Watanabe references. Withdrawal of the rejection is respectfully requested.

### **New Claims**

New claims 44-55 have been added by this response. The new claims do not add any new matter and are believed to be patentable over the cited references. No fee is believed due at this time for the new claims because the new claims do not increase the total number of independent claims or total claims over the originally filed claims. Allowance of claims 44-53 is respectfully requested.

### **Conclusion**

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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Ralph A. Graham  
Reg. No. 47,607  
FLETCHER YODER  
P.O. Box 692289  
Houston, TX 77269-2289  
(281) 970-4545